



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Sandia National Laboratories' Technical Assistance to Native American Tribes

October 17, 2005

Sandra Begay-Campbell
Principal Member of the Technical Staff
Sandia National Laboratories



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
for the United States Department of Energy under contract DE-AC04-94AL85000.





Renewable Energy Resources





U.S. Department of Energy
Energy Efficiency and Renewable Energy

Renewable Energy Technologies





Sandia **VISION**



**Helping our nation
secure a peaceful
and free world
through technology.**



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
for the United States Department of Energy under contract DE-AC04-94AL85000.





Where is Sandia National Labs?



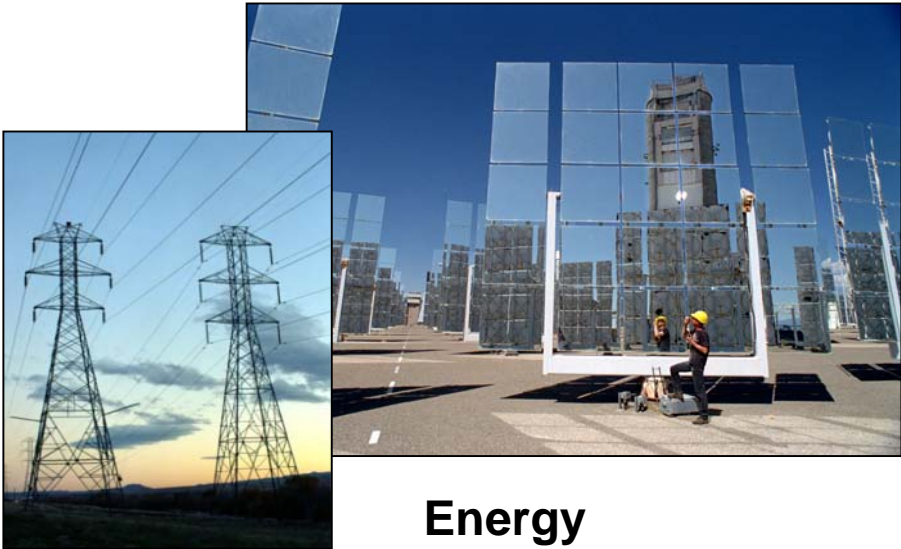
- New Mexico
- California

- Nevada
- Hawaii
- Texas





Sandia addresses the surety (safety, security & reliability) of critical infrastructures



Energy



Transportation



Architecture



Communications



DOE's Tribal Energy Program **Tribal Energy Program**

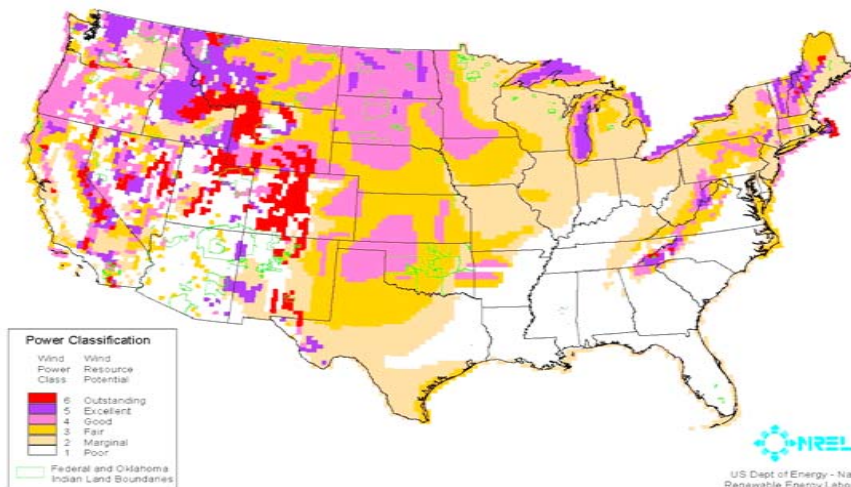
Sandia & NREL Provide Information and Technical Assistance

Technical Assistance

- Expert Advise
- Models and Tools
- Resource Maps

Information and Support

- Regional Workshops
- Program Brochure
- Tribal Energy Website
- Guide for Tribal Energy Development (Under development)





Education Program

Student Internships

**Three summer interns
sponsored (2003, 2004)**

**One summer intern
sponsored 2005**

**Year-round interns sponsored
(2002-2005)**

2005 Students

Tanya Martinez

Debby Tewa

Jennifer Coots



2005 Student Interns



Sandia's current technical assistance to tribes



**Propane generator will be used as a back-up energy source
for the Ramona Band's micro-grid hybrid system.**

Sandia provides technical assistance for the DOE Tribal Lands Program awardees.

- Continued support of an ecotourism development (CA-Ramona Band of Cahuilla).
- Partnership with Navajo Nation – Navajo Tribal Utility Authority NTUA Wind Feasibility Study

Albuquerque's Southwestern Indian Polytechnic Institute (SIPI) designed & installed photovoltaic, wind and solar hot water systems to educate and train Native American students in renewable energy technology.

- With the students' assistance, SIPI operates and maintains the systems.

Tribal Energy Website
www.eere.energy.gov/tribalenergy



DOE/Sandia's technical assistance to the Navajo Nation through NTUA's Solar Program

- Support NTUA as a Leader in Rural Solar Electrification
- Assist NTUA Solar Program Coordinator to create a sustainable program
- Convey NTUA's success in solar to others, including the Department of Energy



DOE, Sandia and Navajo Nation signed an MOU for collaboration and technology transfer for the Navajo Nation, which emphasizes energy, environment, education, economic development, communication



NTUA's Technical Changes

..1993.....1999-2001.....2002-2003.....2003-2004.....

240-260 Watt



**Business potential
realized**

640 Watt



**Standardization
achieved**

Phase I 880 Watt Hybrid



**Battery bank powered
by hybrid design**

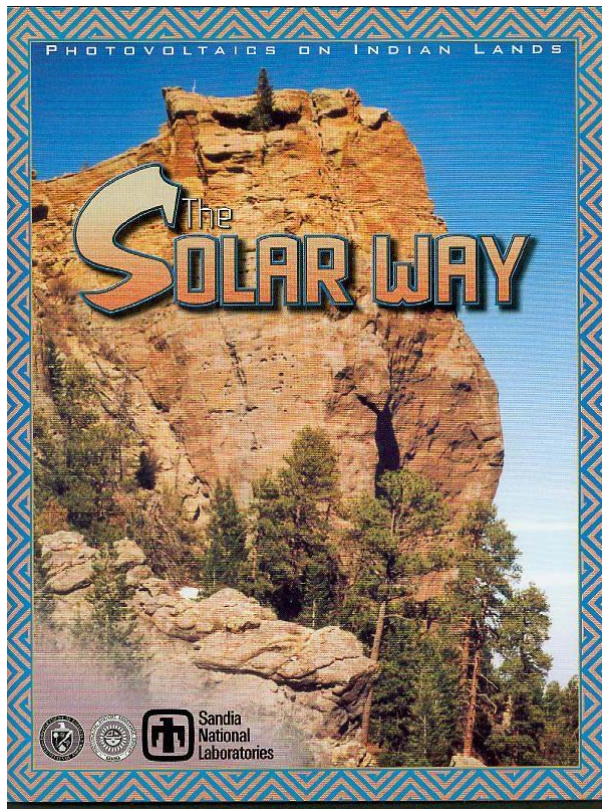
Phase II 880 Watt Hybrid



**Economic
Development:
Units
assembled on
Navajo Nation**



The Solar Way: Photovoltaics On Indian Lands Published At Sandia



The full-color, 60-page document illustrates the myriad uses of PV on tribal lands throughout the United States.

The book uses the Seven Generations philosophy to come to organize the material.

- Caring for the earth and things on it, and living as sovereign people for Seven Generations

The book is intended to help tribes make informed decisions about photovoltaics.

- With extensive contacts listed, tribes can network and also conveniently seek technical assistance as they move forward with solar electricity projects.



Tribal Energy Program

Tribal Council

